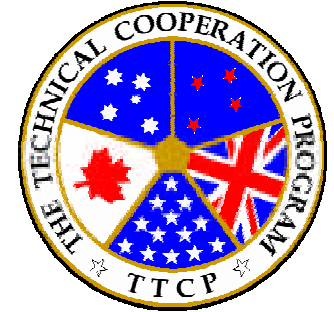


US/UK

Technology for Optimized Manning

**The Technical Cooperation Program (TTCP):
HUM TP-9 Human Systems Integration for Naval Systems
Annual Meeting at DCIEM TORONTO, CANADA
5-9 June 2000**

**Naval Undersea Warfare Center
Newport, RI 02841 USA**

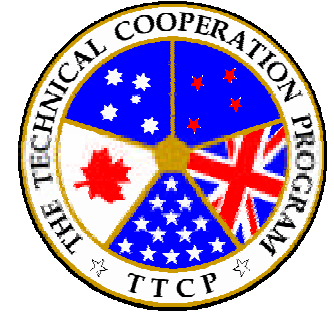


The Collaborative Program

- **Shortfalls being addressed**
 - Lack of technology application to optimize ship's complement for operational tasks in the post DD 21/FSC time scale
- **US & UK Roles - complimentary S&T**
 - First joint workshop - 23-24 February, 2000
 - Second joint workshop-21-23 June, 2000
 - Gap analysis study is underway to formulate programme
- **Collaborative Vehicle**
 - Master Information Exchange Memorandum (initially)



Establishing Common Ground

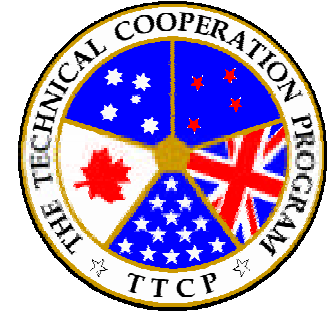


Optimized Manning definition:

- ***The manning is to be sufficient to meet the manpower effort required to successfully fulfill the tasks of the unit throughout its planned lifecycle at minimum cost and acceptable risk to the service.***
- ***"Minimum cost to the service" includes costs related to infrastructure (e.g. training, maintenance, recruitment, retention).***

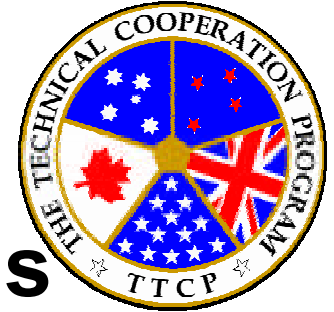


S&T Challenges / Major Components



- **Optimally Manned Ship**

- Human-Systems Integration / Human-Centered Design
- Top down function allocation / Crew modeling
- Advanced Decision Support and Information Management
- Simulation Based Training/Recruitment Screening/Skill Assessment
- High-Performance Distributed Computing
- Condition-based Monitoring and Control
- Automated Machinery and Damage Control
- Collaborative Planning/Interoperability Issues
- Netcentric Warfare/Force Data Fusion/Bandwidth
- New Materials / Coatings



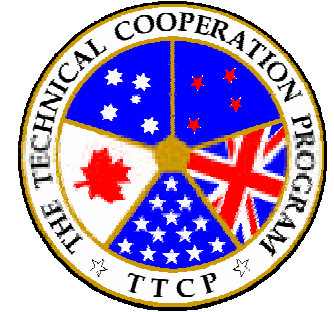
TOM- Related Work / Programs

- **ONR-Sponsored Work**

- Individual/Team Training
- Reduced Ships Crew by Virtual Presence
- Virtual Environment Technologies
- Advanced Decision Support
 - Multi-modal interaction
 - Task & workload management

- **UK-Sponsored Work**

- Human Factors Integration
- Complementing & Crew Modeling
- Decision Support Tools
- Embedded Trainer
- Synthetic Environments
- Wide range of other work not specifically targeted at reducing manning but with manning components



TOM- & Potential Impact of Program and Potential Transition Routes

•US

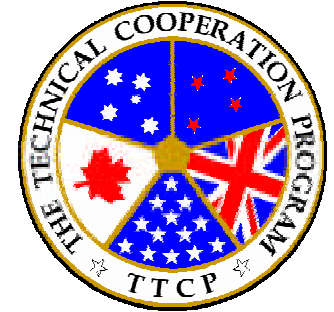
- DD 21 upgrade**
- CVN 77 upgrade**
- CVN(X)**
- CG 21**
- NSS(X)**

•UK - technology insertion to:

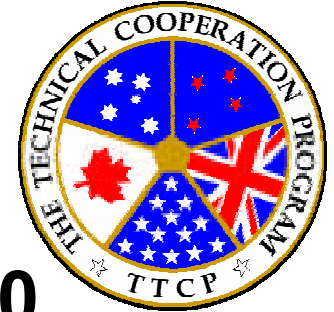
- Type 45**
- FSC**
- CVF**
- FASM**



Relationship to National Naval Programs & Responsibilities



- **US (Spikes, Thrusts & Grand Challenges)**
 - DD 21 (Spike)
 - Naval Battlespace Awareness (GC)
 - Naval Materials by Design (GC)
 - N86 S&T capability
- **UK (Above Water Battlespace)**
- **Under Water Battlespace**
 - FSC
 - CVF
 - FASM
 - Versatility/OOTW



Workshop I- 23/24 February 2000

Attendees:

ONRIFO

NUWC

NPRST

SSC SPAWAR

NSWC

MOD DEC(AWB)

DNM (Policy)

DERA CHS&SS

DNM(Planning)

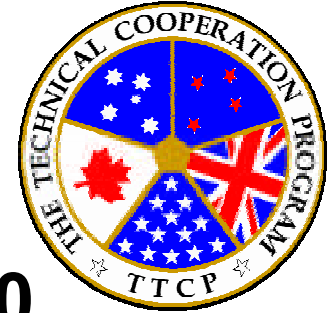
CINCFLEET

FSC IPT

FASM IPT NMA

CVF IPT

Type 45 IPT



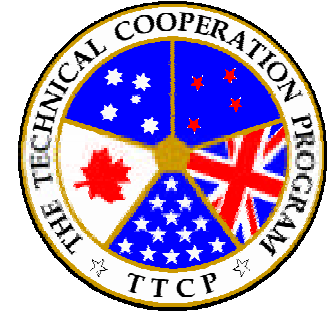
Workshop I- 23/24 February 2000

Results

- a) Consensus on the definition of “Optimized Manning”**
- b) Agreed on issues to be addressed**
- c) Agreed to conduct joint US/UK gap analysis & report back**
- d) Coordinated effort to establish programme, set agenda, meeting schedule**



Plan of Action

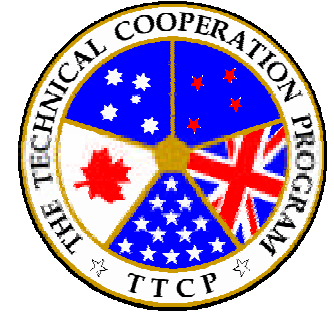


- I. US & UK will :**
 - a) identify relevant national programmes**
 - b) conduct national gap analysis of related programs**
 - c) conduct joint gap analysis**
 - d) propose S&T collaborative areas to fill gaps**

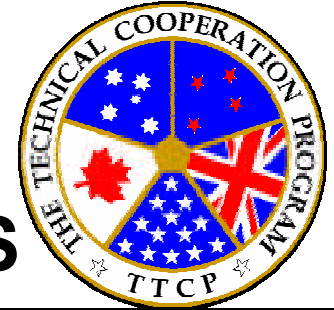
- II. Meetings scheduled to report on findings and strategy:**
 - a) 23-24 February - DERA, Portsmouth-West**
 - b) 14 April - MOD Whitehall, London**
 - c) 21-23 June - Joint US/UK workshop-Wash., DC**



S&T Challenges

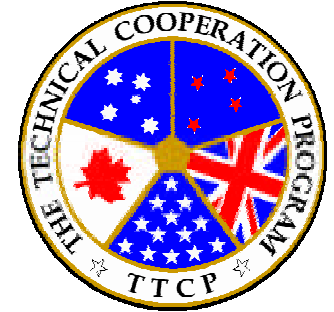


- **Virtual Presence**
 - **Tele-presence**
 - **Tele-operation**
 - **Distributed Collaboration and Decision Support (Joint, Allied)**
 - **Intelligent Network Agents (Automated Information Search, Retrieval, Fusion)**
 - **Sensors, signal processing, and ship level simulation**



US / UK RELATED PROGRAMS

Major Areas	Subtopics	Personnel		
		Recruit, Select, Retention		
		Complete	Current	Proposed
Combat Systems	OPS/C4I			
	Combat			
	Nav/ Platform Control			
Propulsion	Engineering			
	Damage Control			
Admin/Logistics	Supply/Admin			
	QOL/Crew Support			
	Spans Multiple Areas		Sailor 21	
US Assigned				
UK Assigned: (DERA CHS; MOD DEC (AWB); MOD DPA				
		for each:		
		Project Title		
		POC		
		Summary		
		Specific Application/Caveats		

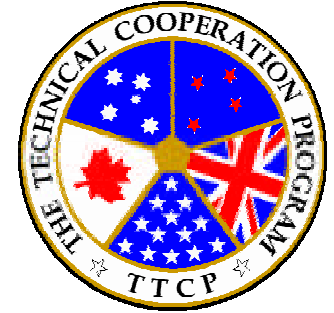


Future Plans

- **Goals for Workshop #2 - 21-23 June, 2000**
 - a) **identify gaps to be filled**
 - b) **coordinate the development of joint S&T efforts to mediate shortfalls**
 - c) **develop US/UK teams to address individual topics/issues**
 - d) **outline milestones, deliverables & funding**



Summary



- **Identifying existing technologies & shortfalls**
- **Identifying critical areas of collaboration**
- **Moving forward with plan of action**
- **Develop Collaborative Research Programmes to support optimized manning**